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## PROGRESS OF PUBLIC HEALTH WORK

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**P**UBLIC health work is as old as history. Among the ancients a part of it was purposeful; a part without intention,—both were valuable in the preservation of mankind.

The Egyptians filtered the muddy water of the Nile which rendered it potable, and in a measure prevented the spread of disease. Their custom of mummifying the dead by keeping them in brine for seventy days, then drying and placing them in tombs in the hills above the over-flow of the Nile was not without sanitary significance. They had rules concerning meat inspection, bathing, clothing, diet, and care of infants. Joseph's Well near the pyramid of Gizeh was excavated through solid rock for 297 feet, and is an excellent example of their efforts to obtain pure water.

The ruins of antiquity show that large reservoirs were common in ancient times. It is well known that the Chinese, for thousands of years, have used alum as a coagulant in the clarification of muddy water. The inhabitants of India, over 4,000 years ago, knew, "It is good to keep water in copper vessels, to expose it to sunlight, and to filter it through charcoal."

The Hebrews were the founders of public health work. Their methods were influenced by the practices of the nations that lived in the valleys of the Tigris and Euphrates, and probably by Persia. The Apostle Luke, a physician, says, "Moses was learned in all the wisdom of the Egyptians." The Hebrews obtained excellent results in wholesome living by making hygiene a part of their religion. The high priests were sanitary police. Their mandates covered diet, the touching of unclean objects, prevention of contagious disease, isolation, disinfection, sanitary inspection, removal of nuisances, certain industrial practices, personal hygiene, and medical jurisprudence.

The teachings of the Greek philosophers and physicians contained principles which promoted the well-being of the people as a whole. The laws of Solon and Lycurgus were especially helpful in improving the health of the masses. The Spartan requirements for warriors, the Olympic games and the emphasis placed upon the winning of distinction in them, together with the prominence given

to physical perfection in sculpture, art and literature inspired the youth to maintain a high degree of health.

The Romans were among the first of the ancients to provide methods for good ventilation of houses. Cremation, systems of drains and public baths were important contributions to sanitation and hygiene. The cloacae of the Romans were the forerunners of our sewerage systems. The great aqueducta, which brought fresh mountain water to Rome, played an important part in the prevention of epidemics. Their analogues are found today in the water supply of New York which has its source in the Catskills and is carried to the city by the Croton and Catskill aqueducts.

The Crusades, mis-rule, and innumerable wars prepared the soil and sowed the seed of the great epidemics in the middle ages which threatened man with extinction and gave the fatal thrust to tottering civilizations. Crowded conditions, the bad sanitation of the walled medieval towns, and gross immorality were the great predisposing factors. Gorton tells us that as late as the 16th century the English housewives swept the refuse from their dwellings into the streets. People seldom bathed or washed their clothes. Even eminent ecclesiastics swarmed with vermin. The garbage was emptied into unpaved streets and ground to mush when it rained. At nightfall shutters were opened and sewage poured into the streets.

The intellectuals of Rome, Alexandria and Constantinople were lost in a maze of theological controversy. Epidemics were regarded as a "visitation from God" inflicted alike upon the innocent and the guilty, to chasten a sinful world. As a result, no great effort was made to prevent them. Humanity escaped from the severe ravages of ergotism, scurvy, and influenza to be swept off by black death. Bubonic plague appeared in 1346 and killed sixty million people, over one-fourth of the earth's inhabitants. Plague visited London many times and would have depopulated it had not the people fled. Burning of the city killed the rats and reduced the plague. In 1495 syphilis appeared at the siege of Naples in epidemic form. In a few years, it had spread over the world,—a sad commentary on the morality of the time.

In the midst of the ravages of the plague, the first guardians of public health were appointed, and quarantine was attempted. It was tried in Venice and later extended to other Mediterranean ports, and to the North and Baltic seaboards. Health ordinances were promulgated and pest houses erected. During this period leprosy was at the height of its virulence and leprosaria were founded for the isolation of its victims. Each leper was compelled to carry a rattle, and to give notice of his presence by sounding

an alarm. The crude quarantine of the middle ages became the modern procedure based on scientific knowledge; the scavenger and the nuisance inspector specially trained live again in the expert sanitarians of today.

Although measures for the prevention of nuisances and for the imposition of quarantine were adopted in colonial days, as far back as 1647, it was not until 1849 that the State authorities began to consider seriously their duties in connection with public health. In May of this year the Governor of Massachusetts appointed a commission under Lemuel Shattuck to ascertain the health needs of the commonwealth and to make recommendations.

The Shattuck commission advised the establishment of a central Board of Health charged with the general execution of the health laws of the State, the creation of local Boards of Health, the taking of a census of the people, and a systematic registration of marriages, births and deaths. It recommended an investigation into the cause of disease, abatement of the smoke nuisance, adoption of means for public health education, and other far-reaching measures. The report of the committee to the legislature was pigeon-holed for twenty years, but in 1869, the State Board of Health of Massachusetts began work under a broad charter, which has been the model for other states. In 1877 Illinois became the second state to establish a Board of Health.

Permanent governmental health organizations in the country came into existence to combat repeated outbreaks of cholera, typhus and yellow fevers. They were created when disease was supposed to have its origin in filth; when sewer gas and foul odors were thought to be the cause of epidemics and night air to carry illness and death.

#### SANITATION

Under the influence of the filth theory of disease, the efforts of public health officials were concentrated on the abatement of nuisances by scavenging, by constructing sewers, and by building water-closets. They enforced measures to prevent overcrowding, to insure better housing, to promote ventilation, and to provide for a supply of safe milk and of unpolluted water. Such was the nature of public health work until the decade of the 80's, when the rapid, brilliant discoveries of bacteriology, showing the relation of micro-organisms to diseases, gave to the world a different conception of the cause of contagion.

The "sewer-gas-foul-odor-night-air era" of public health work was one of considerable progress. In their vigorous attempts to eliminate "emanations which polluted the air," sanitarians made great contributions to comfort, common decency, and public health.

We know now the safe disposal of sewage and the provision of pure water supplies were great factors in the eradication of cholera, and in the reduction of typhoid fever and the "diarrheas." Less crowded living conditions and cleaner houses did much to decrease vermin and louse-borne typhus fever. General cleanliness may have slightly diminished the incidence of disease spread by the secretions from the nose and throat. It had little effect upon the occurrence of yellow fever.

While the pioneers in public health did much for comfort, convenience, and civic betterment, their erroneous conception as to the cause of disease has remained an unhappy legacy to succeeding generations. There are many today who fail to distinguish between filth, contaminated with disease germs, and unsightly rubbish, in itself incapable of causing illness. Believers in sewer gas are not entirely extinct even among the medical profession. Emphasis upon air as a carrier of disease kept down bed-room windows and delayed the building of sleeping-porches for several generations. Fear of air-borne disease still causes a great waste of formaldehyde gas in fumigation which is often more effective in the production of psychic calm than in the destruction of pathogenic bacteria.

In 1893 Smith and Kilbourne brought to the attention of the world the role of the tick in the spread of Texas fever in cattle. Within a few years the relation of the mosquito to malaria and yellow fever, of the rat and the flea to plague, of the tsetse fly to African sleeping-sickness, and of the louse to typhus fever were shown. These discoveries of insect transmission of disease were of as far-reaching importance to the world as those of Copernicus, Columbus, or of Edison. Ross, Reed, Nicolle, Kitasato, McCoy and others showed insects to be the center of a system around which revolved the great pestilences which have scourged the race from antiquity. They did not discover unknown continents, but they made it possible to create a new world within the tropics. The practical use of their researches made the Panama Canal possible, saved the South from yellow fever, reduced disease and increased progress wherever the flea, louse, or mosquito are to be found.

The knowledge of the relation of insects to disease intensified sanitation. Stagnant pools were drained or filled, swamps ditched, rain barrels screened, and tin-cans destroyed to eliminate the breeding places of the yellow fever and malaria producing mosquito. In screening against the mosquito, the danger from the fly was reduced. To prevent plague, the rat was destroyed along with his fleas, to the great saving of food stuffs. Domestic sanitation and personal hygiene made new progress, as it became generally known that typhus fever was carried by the louse.

### ISOLATION

Following the demonstration that communicable disease was due to specific micro-organisms, over-emphasis on the environment as the origin of disease gave way to control of man in preventing it. Rules and laws for the isolation of patients and carriers were enacted. Enforcement of these regulations gave rise to compulsory notification of communicable disease and the establishment of laboratories to ascertain the presence or absence of the specific bacteria. The length of incubation, the period of communicability, and the manner in which the disease is transmitted became the factors determining the length and nature of quarantine.

A great deal was expected from thorough isolation. Much was accomplished, but careful observation soon revealed that complete eradication of disease by this method was not to be realized. Isolation with bacteriological control, in all probability, will eliminate typhoid, paratyphoid, and the dysenteries. It has kept cholera beyond the seaboard, and in connection with sanitation, has made typhus fever a comparatively negligible disease in this country.

The failure of the discovery of the cause of chickenpox, smallpox, measles, German measles, and scarlet fever make it impossible to obtain the results first expected from isolation, because of the inability to recognize all cases before they have become communicable, and to determine with certainty the exact period at which they cease to be infectious. For a similar reason mild cases and carriers are missed. Scarlet fever and infantile paralysis present typical forms which are frequently overlooked. Whooping cough and mumps are often transmissible before symptoms are sufficiently developed for diagnosis.

In dealing with sputum-borne disease, isolation is very helpful, but often ineffective. The epidemic of poliomyelitis of 1916 taught health officers their inability to suppress it. It was stopped by the falling temperature of autumn rather than by the will of applied science. Influenza swept the world in 1918 and burned out before means could be found to control it. Meningitis exacted a deadly toll in the armies of both Europe and America; measles, complicated by pneumonia, proved one of the most fatal of diseases to soldiers in cantonments.

Experience with isolation in the prevention of disease has shown that to be effective it must be early. The failure to isolate promptly the first patient cannot be off-set by the most rigid quarantine of subsequent cases. Isolation has probably done a great deal to eliminate virulent strains of many communicable diseases since they are usually quickly recognized. "Every case of tuberculosis isolated means an average of three less new infections."

#### GROUP PRACTICE

For centuries medical practice has been individual. The patient sent for the doctor, was cared for by him, and paid the bill. As little was known concerning the cause, method of spread, or means of prevention of disease, the physician had little responsibility to the community beyond the observing of a crude quarantine and the giving of an opinion as to the relation of nuisances to illness. The rapid advances in biology, chemistry and preventive medicine have shown the social and economic aspects of disease, and are rapidly changing medicine from being paramountly personal to predominantly public.

If a child should have infantile paralysis in a community, the public would insist upon it receiving every consideration essential to comfort and an early recovery, but the people would want to be sure that the case was so managed that other children would not lose their lives or be crippled for life. The citizens of any city would be greatly interested in a single case of Asiatic cholera occurring in their midst because it might prove the match for an explosive epidemic that would effect the lives of thousands and turn millions in trade from the channels of business.

As a result of this public appreciation of the importance of disease, there have arisen numerous agencies endeavoring to prevent accidents and illness in particular groups of individuals. These organizations are rendering a fine service in the education of the public, in the improvement of health, and in civic betterment, but they greatly need to be correlated, and to be given responsibility commensurate with their relative importance. It is essential for them to become a unified force for health in order to secure a synchronous attack upon disease with the best available methods.

#### MATERNAL AND CHILD WELFARE

The United States loses one mother for every 154 births, the highest rate of the seventeen principal countries of the world. Over 23,000 women died in 1918 on the altar of maternity, at least 50 percent. a needless sacrifice to poverty, ignorance, and inadequate medical and nursing attention. The United States stands eleventh in infant mortality, losing one in every ten during the first year of life, which is twice that of New Zealand, the lowest. In the United States a new born child has less chance of living a week than a man of ninety; of living a year than a man of eighty.

The great enemy of the mother and baby is poverty. The smaller the wage of the father, the poorer the family, the greater the hardships upon the mother, and the less the chance of the child to survive the first year. Income plays the chief role in locating the home and in determining its kind. Low income often sends the mother

to work, substitutes artificial for natural food, encourages bad housing, and promotes insanitary surroundings. Studies of infant mortality, made by the Children's Bureau in Waterbury, Connecticut, showed that children born in rear houses or in houses on alleys had a death rate of 172 per 1000; those located on the street, 120.6. In Manchester, New Hampshire, the rate was 123, where the number of persons averaged less than one per room, and 261.7 where they averaged more than two but less than three. The mortality for babies whose mothers were employed outside of the home was 312.9 per thousand while the rate was 122 for those whose mothers had no occupation but the care of their households.

From surveys in small cities, in rural districts, and in the large city of Baltimore, it was found that regardless of color, race, or nationality, the infant death rate varies inversely with the income of the father. When the father's income represents the ability to insure care and comfort (\$1850 a year or more), the death rate was one-fourth as high as when the father's earnings fell into the lowest wage group (\$450 or less).

Ignorance, as exhibited in the feeding and care of the infant, is an important factor in the death rate. It is not, however, limited to any one class of society, but operates most viciously in the group whose means of defense are most weakened by poverty. The mother, both ignorant and poverty stricken, is a menace because she is socially helpless unless the community or a philanthropist takes the responsibility of providing her adequate medical and nursing care, proper instruction in hygiene of maternity and of infancy, and decent housing.

Application of available knowledge will reduce maternal and infant mortality by 50 per cent.; possible 75 per cent. The great public health problem is to educate the individual to demand, and the community to supply the necessary protection for mothers and children by providing prenatal and postnatal clinics and maternity hospitals or wards in a general hospital. It is necessary to supervise rigidly the training of midwives, and to provide better education for medical students in obstetrics.

A comprehensive plan in maternal and child welfare must include teaching and practical demonstrations for mothers in the household arts essential to her welfare and to that of her child. Consultation centers or welfare clinics for children must provide for periodical examinations and instruction as to nutrition, health, exercise, and recreation. It must take into consideration the welfare of the defective, delinquent, and dependent children. It must conserve the rights of children in reference to person, labor, education, and law. It must guarantee the interest of the child will be paramount in marriage and divorce, and that it shall receive justice whether legitimate or illegitimate.

### RURAL HEALTH WORK

It is estimated for the country at large that for every composite group of 71 persons, one will die during the year; two will be in bed constantly; thirty will have impairment of health, ranging all the way from the person who is just able to be out of bed to the one not quite up to normal; twenty-five will be what we call healthy, while thirteen will have that vigor essential to rendering dynamic the inspiration of high ideals. This general average applied to the rural sections which contain 48.1 per cent. of the population of the country, makes it possible to visualize the problem of rural health work and its relation to the ability of the rural population to pursue its vocation effectively. As the rural population feeds and clothes the state and is the foundation upon which cities and industries are erected, its illness presents a striking phase of the economics of disease.

The problem of rural health work can be successfully approached only by education of the individual to appreciate the importance of disease and to adopt the methods necessary to prevent it. The most effective educational agency is an adequate county health organization directed by a full time health officer with a sufficient number of properly trained public health nurses, sanitary inspectors and clerical assistants to do the work.

The first duty of the organization is the education of the public in respect to hygiene and sanitation. To this end, lectures and demonstrations are given, pamphlets and folders distributed, and articles on live health topics are prepared for the county papers. Exhibits are arranged in the schools and at the county fairs. The assistance of the movie is obtained and cooperation is given to every organization in teaching the facts concerning health.

Another important function of the county health organization deals with the control and prevention of communicable disease. In cooperation with attending physicians, the county health officer enforces the quarantine regulations of the state, determines the sources of contagion, and in collaboration with the public health nurses, visits schools and homes; in cooperation with teachers and parents he institutes measures for prevention of disease, arranges for physical examinations of children, and advises as to corrective measures. The public health nurses carry out the follow-up work. The health officer ascertains the occurrence of tuberculosis in the county, adopts measures to prevent its spread, and arranges with local physicians to establish clinics for persons with suspicious symptoms of the disease.

As far as practical, each home in the county is visited by the health officer, and a survey made of the construction and use of

latrines, the safeguarding of the water supply, and the handling of milk. He inspects the screening and advises as to the means to be employed for the elimination of the breeding places of the fly and the mosquito. A nurse visits each house where bottle-fed children are suffering from digestive disturbances, and gives instruction to mothers in the essentials of home sanitation and infant care.

As only 56 per cent. of the 3,027 counties in the United States have hospitals, a number of the directors of county health organizations find it necessary to give considerable time to the creating of public sentiment favorable to the establishment of adequate hospital facilities or centers where clinics may be held. These clinics are held in cooperation with the local physicians and with specialists from the State Department of Health or from the state medical schools.

#### INDUSTRIAL HYGIENE

The wide use of chemistry in industry, the substitution of steam for water-power, the evolution of refrigeration, the increasing application of very high temperatures in working metals, the necessity of working in rarified and compressed air, the almost universal use of electrical energy in the mechanical arts, the development of rapid transportation, the extensive employment of artificial light, the strenuousness of a machine-set pace, and the overcrowding in manufacturing centers and in factories have produced new types of illness, have intensified the ravages of communicable disease, and have created industrial hygiene as an important branch of public health work.

Far-seeing managers of modern industries have found it to be as important to conserve, stabilize and render efficient their working forces as to prevent waste, adopt better methods of manufacturing, or to improve their salesmanship. They have noticed that output increases, their labor troubles diminish, and their overhead expenses decrease where human and mechanical engineering are best coordinated. They know that the most capable workman is healthy, contented, and is able to do his work rapidly and well.

The number of industries that are establishing welfare departments to deal with their employees is steadily increasing. Greater efforts are being made to improve the morale among workers by providing better sanitary conditions in work-shops, and by the construction of adequate safe-guards against accident, dust and fumes. Men and women are given medical attention and surgical care where the employer is responsible. Precaution is taken to prevent and to control communicable disease.

Sanitary lunch-rooms are provided to furnish adequate food at cost. The employees are given instruction in safety-first, first aid,

and hygiene. When the labor is monotonous and exhausting, arrangement is made for rotation in work, period for relaxation permitted, and time allowed for recuperation.

The director of industrial welfare gives advice to the employees in the adjustment of social and financial difficulties. He endeavors to provide profitable recreation, and he encourages thrift, domesticity, and morality. There is a close relation between the home and the community life of a man and his industrial efficiency and reliability. While the worries which beset a workman are his private affair, they take a great deal of his attention from his job at the expense of his employer, and sooner or later become a problem for his physician. Tactful advice leading to contentment and constructive living is neither meddlesomeness nor paternalism,—it pays dividends to both employer and employee.

#### MEDICAL INSPECTION OF SCHOOLS

Preventive medicine does some of its best work in connection with public schools. Proper medical supervision of schools includes a school nurse service as well as medical inspectors. It applies to buildings and to equipment, as well as to the mind and to the body of the child. About twenty million children, nearly one fifth of the population of the country, are compelled to spend, on an average, five hours a day in school one hundred and sixty-five days in the year. Under such circumstances, as effective precautions should be taken to insure ventilation, lighting, heating, proper furniture and general sanitary conditions in the school to provide for the child's physical welfare as to enforce its attendance. It is obviously unfair to require a child to occupy a seat likely to produce body deformity or to study in a light that may impair its vision. It is equally unjust to bring together a number of young persons at an age when most susceptible to communicable diseases without medical supervision, unless the school is to provide a great disease exchange for the community. It must be remembered that the twenty million children of elementary-school age come in contact more or less intimately, with approximately twelve million others of pre-school age. These younger children are very susceptible to infectious diseases and are in the age group in which eighty-five per cent. of the mortality occurs.

When medical inspection is properly done, a disease history of the child is obtained on entry, and a number of defects and functional diseases will be discovered on examination that may be corrected. It provides a careful medical record preliminary to physical training, will determine in what individuals corrective gymnastics are needed, and, by periodical examination, will ascertain the physical progress of the child. The community should realize,

however, that it is of little value to spend money to discover defects unless provision is made to remedy them when they are found. Each school district should provide a dispensary service for school children and parents must be educated to consult their family doctor on questions of prevention before their children become ill.

#### PHYSICAL EDUCATION

Physical education is preventive medicine in action. It should have for its purpose the development of the functional power of the child to the highest level consistent with the most successful training of its intellect; it should meet the needs of the weak, who require it most, as well as of the strong; it should be graded for various ages; its progress should be determined by tests and measures of development, strength, agility, endurance and ability to do. Its proficiency should be based upon well-defined accomplishments, not upon certain periods of exercise.

In general, provision must be made for the physical education of three classes of individuals: (1) the physically normal, (2) the subnormal, (3) the abnormal and physically defective.

The physically normal individual should be required to take general exercise, but should be encouraged to select some form of sport and to acquire a fondness for it. In the primary school it may mean games and outdoor exercise; in the high school or college the development of an "athletic hobby" to keep him in "fighting trim" when required to lead a sedentary life.

The subnormal individual, underweight and understrength, for his age, undeveloped but organically sound, will require special and general exercise to meet the tests of normal. Having shown his ability by passing the required efficiency tests, he may be further educated in that group.

The abnormal group is composed of individuals distorted as to posture or carriage, but who may become greatly improved by corrective gymnastics. In this class are also those with heart lesions, hernia, diseases of the joints, marked flat feet, etc. A considerable number of these could be cured by proper surgery, and would be, if their parents were so advised by a medical inspector in whom they had confidence. All would be greatly benefited by special calisthenics and other light forms of exercise under medical supervision. In many instances members of this group have been led to attach too much importance to their condition. Nothing will do more than safe, beneficial exercise to lift them from the despair of chronic invalidism to the enthusiasm of physical well-being.

Physical education is a great antidote for antisocial tendencies. It teaches temperance, self-control, courage and endurance. It produces the ability to play the game to the end and to lose with a

smile or to take victory with modesty and magnanimity. It Americanizes and de-hyphenizes by the democracy of the playground and by the catholicity of its games. It places the nation on the solid foundation of physical soundness, morality, and vitality.

#### ORGANIZATIONS PROMOTING PUBLIC HEALTH

Organizations promoting intelligent child labor legislation and passage of wise laws improving working conditions, particularly of women, are engaged in important public health work. Military training, the Boy Scout and Camp Fire Girl movements and mass athletics lead to physical vigor and constructive thinking. The practical application of mental tests and careful study of factors influencing their results stimulate interest in the social and physical welfare of children in the largest sense. The creation of parks and playgrounds provides fresh air, exercise, and shade essential for the well-being of children, especially of small children. City zoning tends to ventilate dwellings, to introduce sunlight into the home, to reduce noise and to purify the air. It leads to that restfulness essential to complete recuperation from a day's work.

#### THE DEMONSTRATIVE METHOD

Nothing equals in effectiveness a clear-cut demonstration of what can be done. The International Health Board is actively engaged in showing what results may be obtained by intensive practical application of preventive medicine. For example, it enters a community where malaria is prevalent, and concentrates its attack upon the disease by destruction of the breeding places of the mosquito, treatment of persons with malaria, and by screening all houses. It drains swamps, ditches, meadows, fills in or oils stagnant pools, clears away underbrush, and stocks the creek with top minnows to eat the mosquito larvae.

Its agents in cooperation with the local health organizations, visit every home in the community in search for defective drain pipes, uncovered rain barrels, and for bottles, cans, or other objects that may hold water in which mosquitoes may breed. The screening of the house is examined and advice is given as to how to make it most effective. If members of the family have malaria or give a history suspicious of the disease, they are examined clinically, and a course of quinine administered.

Such an intensive attack is invariably followed by a most significant reduction in the occurrence of malaria. As every home is visited, the work receives wide publicity. It becomes the chief topic of conversation at the meeting of the sewing circle, on the golf links, and at the corner grocery. On conclusion of his work, the director summarizes his findings, estimates the cost, and shows that the pre-

vention of malaria saves both money and suffering. He calls attention to the increased value of the drained land and the general improvement in appearance of the community by the removal of the underbrush and the stagnant pools. The people at first are skeptical, later become curious, and in the end are convinced that public health work of this type is of immediate value to them. They know what has been done and how it was accomplished, and are usually ready to see that the proper measures are adopted to prevent the return of the disease.

The intensive method has been widely used by the Rockefeller Foundation in its campaign against malaria and hookworm. In Framingham, Massachusetts, it is being utilized in the study and prevention of tuberculosis. The United States Public Health Service uses it in certain counties and towns for educational purposes and it has been employed by other organizations in the promotion of child welfare.

#### DISEASE EXTERMINATION

In certain strata of the earth are to be found the remains of animals and plants which once inhabited it, but were unable to survive the conditions of their environment. They perished for lack of food, could not adapt themselves to the variations of the soil, could not withstand the unfavorable alterations of temperature and moisture, or were unable to resist their enemies, both animal and vegetable. It is within the power of man to so alter his living conditions and to so change the environment of micro-organisms as to enforce either their biological modification or extinction.

The virus of smallpox would have a hazardous existence in a vaccinated world. The Schick test, toxin-antitoxin immunization and antitoxin administration present to the virulent diphtheria bacillus the problem of the American bison. Asiatic cholera and typhoid fever await the coup-de-grace of sanitation and inoculation. Successful warfare on the cootie brings extinction to typhus fever. Malaria and yellow fever are ready for the fate of the dinosaur, when means available are universally used in their eradication. Bubonic plague, the giant of pestilences, takes its place with the mastodon, when measures adopted to control it in America are used throughout the world.

Economics, sociology, and preventive medicine point to a hundred ways for the promotion of the public welfare,—to a thousand paths for the successful pursuit of health and happiness. It is futile to seek a far distant Utopia through a maze of “isms” and “pathies,” when education to appreciate and to use the fruits of the research laboratories of the world will produce those living conditions and that healing which are the very essence of practical Christianity.